

# MISSOURI. Conservationist

VOLUME 73, ISSUE 5, MAY 2012 • SERVING NATURE & YOU



# Mission Possible

Missouri is known for its diversity of landscape features. Ozark mountains, glaciated plains and floodplains along the nation's two mightiest rivers are just a few examples of the variety

found within our state. These landscapes support the many habitat types and associated forest, fish and wildlife species we enjoy today.

Healthy forests, abundant fish and wildlife, productive waters and rich soils are important building blocks of our state. These resources have a tremendous positive impact at the individual, family, community and state levels. Effective management and protection of forest, fish and wildlife resources is critical to our quality of life and economy.

The Department's mission is: To protect and manage the forest, fish and wildlife resources of the state; to facilitate and provide opportunity for all citizens to use, enjoy and learn about these resources. As we work to fulfill this mission, we recognize that not everyone will always agree with all actions of the Department. However, our com-

mitment continues to increase public input, provide sound resource management, ensure fiscal accountability and maintain conservation areas to encourage public use.

Citizen involvement is an essential component to meeting the Department's mission. Spending time and interacting with citizens is rewarding and an important priority for the Department. These opportunities allow the sharing and gathering of ideas and information between the agency and public. This interaction is a cornerstone of Missouri's conservation program.

The Department continues to openly engage citizens as we work to manage resource issues including diseases, invasive species, rare and abundant wildlife, and maintaining infrastructure ranging from boat ramps, shooting ranges, trails, wetlands and nature centers. A few examples of steps taken to help ensure public input include:

- Ombudsman, Facebook
- Forums and workshops throughout the state
- Meetings on conservation topics
- Commission meetings held throughout the state
- Surveys and opportunities to comment directly in regulation establishment process

I hope our actions demonstrate the value we place on incorporating both biological information and public input as management decisions are made. I encourage you to interact with your conservation department to help ensure the open sharing of ideas and information needed to keep Missouri a leader in forest, fish, and wildlife management. Please contact the Department with your ideas or comments at [mdc.mo.gov/node/3676](http://mdc.mo.gov/node/3676).



A handwritten signature in black ink, reading "Robert L. Ziehmer".

Robert L. Ziehmer, director



## FEATURES

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*by Brett Dufur*

MDC is celebrating the 75<sup>th</sup> anniversary of putting the state's citizen-led conservation efforts into action. In this issue, we highlight MDC's conservation areas and the Department's other public land stewardship efforts that benefit the state's people and wildlife.

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*by Gladys J. Richter*

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*by Nick Kuhn*

Diagnosing and managing urban tree stress

**Cover:** A sedge wren perches on a flower at Dunn Ranch near Eagleville, by Noppadol Paothong.

📷 600mm lens + 2x converter •  
f/8 • 1/320 sec • ISO 800

**Above:** For families with young children, getting acquainted with nature close to home can be an inviting and rewarding experience, by David Stonner.

📷 24–70 mm lens • f/35 •  
1/40 sec • ISO 100

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**WE GO WAY BACK**

Happy anniversary to the *Missouri Conservationist*, and happy birthday to me! I was born Feb. 11, 1936, in southern Missouri (Shannon County).

When I was 9 years old, for a class project we ordered the *Missouri Conservationist* magazine, and I was so excited when my first issue arrived. In 1954, I met and married a good old country boy whose greatest passion was the great outdoors and hunting and fishing. For 52 years, we both enjoyed our monthly friend, the *Conservationist*, and then he left me in May 2007.

My latest issue arrived yesterday and after reading it from cover to cover, I gave it to a friend of mine who also loves the great outdoors and hunting and fishing. My eyes may be getting dimmer, and my steps getting slower, but the *Conservationist* keeps getting better and better with each passing year. Keep up the good work.

*Shirley J. (Hart) Huett, St. Louis*

I am a school counselor at an elementary school. In my mailbox this morning was a copy of the *Missouri Conservationist*. It was supposed to go to the librarian's box next to mine. What a pleasant memory. When I was a little girl (I will be 60 in April), my grandfather had these magazines. I would pretend to be a teacher and would use no other magazine but the MC! It is just as great as I remember!

*Judy Henson, Tarkio*

**FROM FACEBOOK**

Are BB guns considered firearms?

*Barbara Rehling*

*MDC: According to the Wildlife Code of Missouri, the definition of a firearm is: "Pistols, revolvers and rifles propelling a single projectile at one discharge including those powered by spring, air or compressed gas, and shotguns not*

*larger than 10 gauge." This would include BB guns. Municipal ordinances may vary and should always be consulted.*

What is the length limit on walleye and the number you can keep on the Lake of the Ozarks?  
*Taylor Brasel*

*MDC: The daily limit for walleye is four, and they must be a minimum of 15 inches. Check out the Fishing Regulations booklet for these and other limits at [mdc.mo.gov/node/6108](http://mdc.mo.gov/node/6108).*

What are the purple triangle boxes hanging in the trees in the Greenbrier area?  
*Shawn Jackson*

*MDC: The purple triangle boxes are sticky traps placed on ash trees in order to catch emerald ash borers. The traps have been set so that the distribution of this invasive species may be determined in Missouri. To find more info on the emerald ash borer, visit [mdc.mo.gov/node/5326](http://mdc.mo.gov/node/5326).*

Last summer I captured a beautiful picture of a white-lined sphinx moth getting nectar from my petunias in my flower box. It let my husband get close enough to touch it without flying away. I'm wondering if they are fairly common in Missouri? We thought it was some kind of hummingbird until we saw the antenna on its head.

*Patricia Walton*

*MDC: The white-lined sphinx is a common and widely distributed resident species in Missouri. The adults are with us from early April into November each year, visiting a variety of flowers during daylight hours and at night. They are also attracted to lights at night. Their hovering at flowers does resemble the behavior of hummingbirds. We sell a good reference book, called Butterflies and Moths of Missouri, if you are interested in more information on those groups. It's available online at [mdcnatureshop.com](http://mdcnatureshop.com).*



**Reader Photo**

**GOING NATIVE**

Kathy and Greg Branson submitted this photo of a coreopsis growing on their property near Rich Fountain, in Osage County. The Bransons have been working with staff from MDC since 2006. "Our biggest management success has been enjoying the native grass and wildflowers and increased wildlife population," said Kathy Branson. With MDC assistance, the Bransons have converted fescue to native grass and wildflowers, created brush piles for habitat cover and planted shrubs provided by MDC. "We have seen an increase in the quality and quantity of wildlife since we have been making these improvements," said Kathy Branson.



### DEPARTMENT HEADQUARTERS

Phone: 573-751-4115  
 Address: PO Box 180,  
 Jefferson City 65102-0180

### REGIONAL OFFICES

Southeast/Cape Girardeau: 573-290-5730  
 Central/Columbia: 573-815-7900  
 Kansas City: 816-622-0900  
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 Southwest/Springfield: 417-895-6880  
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### SUBSCRIPTIONS

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 Address: Circulation, PO Box 180, Jefferson City 65102-0180  
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### OMBUDSMAN QUESTIONS

Phone: 573-522-4115, ext. 3848  
 Address: Ombudsman, PO Box 180,  
 Jefferson City 65102-0180  
 E-mail: [Ombudsman@mdc.mo.gov](mailto:Ombudsman@mdc.mo.gov)

### EDITORIAL COMMENTS

Phone: 573-522-4115, ext. 3847 or 3245  
 Address: Magazine Editor, PO Box 180,  
 Jefferson City 65102-0180  
 E-mail: [Magazine@mdc.mo.gov](mailto:Magazine@mdc.mo.gov)

### READER PHOTO SUBMISSIONS

Flickr: [flickr.com/groups/readerphotos](http://flickr.com/groups/readerphotos)  
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 Staff Writer Jim Low  
 Photographer Noppadol Paothong  
 Photographer David Stonner  
 Designer Stephanie Thurber  
 Artist Mark Raiihel  
 Circulation Laura Scheuler

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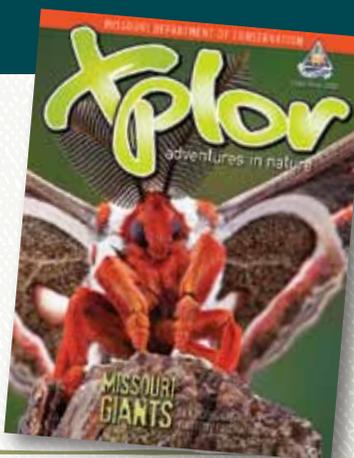
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Brandon Whitley of St. Clair with MDC Deputy Director Tim Ripperger

## MoNASP Winner is Brandon Whitley of St. Clair

Brandon Whitley of St. Clair Junior High School set a new scoring record at the fourth Missouri National Archery in the Schools (MoNASP) state tournament March 24 in Warrensburg, scoring 293 points out of a possible 300. Though his school didn't place in the top three at the state meet, Whitley's record score helped the St. Clair Junior High qualify to take part in the national NASP tournament May 11–12 in Louisville, Ky.

More than 1,100 competitors from 53 schools took part in the state meet, shooting more than 40,000 arrows. At the end of the day, MDC Deputy Director Tim Ripperger presented awards to 30 individual winners and nine schools.

Top schools in the High-School Division were: Crane, first; Willard, second; and Galena, third.

Top schools in the Middle-School Division were: Ridgewood Middle School, Arnold, first;

Holy Rosary, Clinton, second; and Crane, third.

The Elementary Division's top schools were: George Guffey Elementary, Fenton, first; St. Joseph Cathedral School, Jefferson City, second; and Simpson Elementary School, Arnold, third.

Anna Hughes of Logan-Rogersville High School was the top female archer with 281 points. She and Whitley each received a trophy and a special-edition Genesis compound bow.

MoNASP is just one way MDC helps Missourians discover nature by equipping them with outdoor skills. For more information on MoNASP, visit [mdc.mo.gov/node/3409](http://mdc.mo.gov/node/3409).

### Falcon Cam

If you go to [mdc.mo.gov/node/16934](http://mdc.mo.gov/node/16934) right now, you might get to watch a peregrine falcon feeding its chicks in a nest box at Ameren Missouri's

Sioux Energy Center in St. Louis. The birds and the "falcon cam" that is broadcasting their activities live between 7 a.m. and 8 p.m. daily are part of a cooperative falcon-restoration effort by Ameren, the World Bird Sanctuary and MDC.

The female falcon laid the first of her eggs on March 12. By March 20 she was sitting tight on the nest, a good indication that she had finished laying a clutch of four or five eggs. That put the eggs on track to hatch by mid to late April. Peregrine chicks grow rapidly, leaving the nest about six weeks after hatching.

During May, the St. Louis chicks will wolf down meat meals delivered by their parents up to 10 times a day. Late this month, the chicks will be nearly adult-sized, and their parents will have stopped feeding them chunks of meat. Instead, the adults simply will leave whole, dead prey animals in the nest box so the youngsters can learn how to tear them apart and feed themselves.

When it is time to take flight, peregrine parents often try to encourage hesitant fledglings out of the nest. They do this by withholding food and flying around the nest box with tasty morsels in their talons.

MDC Director Bob Ziehmer says the peregrine project is intended to help Missourians discover nature through an intimate window on the lives of an amazing animal.

Peregrine falcons are the world's fastest animals, having been clocked at 261 mph when diving in pursuit of the pigeons and other birds that are their most common prey. For more information on peregrine falcons, visit [mdc.mo.gov/node/3848](http://mdc.mo.gov/node/3848).

### Zebra Mussels at Smithville

In March, routine monitoring found zebra mussels at two sites at Smithville Lake, a U.S. Army Corps of Engineers (Corps) reservoir north of Kansas City.

Zebra mussels are mollusks that look like small clams. They are an invasive species from Eurasia that can cause ecological and property damage.

Corps Wildlife Biologist Mike Watkins and MDC Fisheries Biologist Eric Dennis found three zebra mussels on metal gates at the lake's dam. Later they also found a zebra mussel shell attached to a courtesy dock at the boat launch ramp near the Camp Branch Marina. They found shells of several

sizes, which indicate that the lake has a reproducing population of zebra mussels.

MDC Invasive Species Coordinator Tim Banek says no one can predict what effects a zebra-mussel infestation will have on sport fishing at the lake. Only continued monitoring will reveal how the infestation develops and affects the lake's ecology.

Zebra mussels have caused billions of dollars in damage in the Great Lakes and Mississippi River systems. They filter plankton from the water, and because they can form large colonies, this can alter ecosystems and rob native fisheries of nutrients.

The mussels attach to hard objects such as rocks, metal, boat hulls and water pipes. They also attach to each other, forming dense colonies that can clog pipes. Their sharp shells are a hazard to bare-footed swimmers, and the shells can cut fishing line.

Zebra mussels enter impoundments on infested boats or other marine equipment. How zebra mussels entered Smithville Lake is uncertain. Monitoring found an infestation in a cove near the Camp Branch Marina in 2010. MDC treated the cove with a copper-based commercial algicide to kill the mussels and their larvae. The treatment came after adult zebra mussels were

found on a boat lift that had been moved from another lake. Biologists do not know if that case is linked to the recent find.

There is no practical way to eliminate zebra mussels once they are established in a large lake. Consequently, the mussels likely will spread throughout Smithville Lake, the Little Platte River and the Platte River downstream of its confluence and with the Little Platte. The Platte River enters the Missouri River upstream of Kansas City.

Healthy lakes and streams help make Missouri a great place to hunt and fish and bring millions of tourist dollars to Missouri annually. Fighting



## ASK THE OMBUDSMAN

**Q:** I found a small, vase-shaped object attached to a leaf of one of my dusty miller plants on my porch. Can you tell me what produced the object?

**A:** The vase-shaped structure is a mud nest made by an insect called a potter wasp. Related to mud daubers, the wasps are considered beneficial insects because they prey on caterpillars that eat leaves and other plant tissue. Female wasps lay a single egg in the nest, or brood cell, and then provision it with as many as a dozen paralyzed caterpillars that serve as the food source for the developing young wasp. The provisioned brood cell is sealed up with mud. A hole in the top of the "pot" indicates that the adult wasp has already exited the brood cell. It is speculated that Native Americans used the potter wasp's nest as a model design for their clay pots.

**Q:** I'm seeing lots of box turtles crossing the roads now. Do they migrate?

**A:** Box turtles do not migrate. They may spend their entire lives, 50 years or longer, in a home range of only 30 acres. Good habitat may hold as many as 10 turtles per acre. They become familiar with the resources within their range and should not be moved to unfamiliar surroundings or kept in captivity for a prolonged period.

Box turtles will move about in search of food, water, courtship, an egg-laying site or a resting site. Young male turtles are especially mobile in the spring. Motorists should be alert to box turtles on the roads at this time and try to avoid hitting the crossing turtles, if that can be done safely. The greatest hazard to box turtles is vehicle collisions, but some may also succumb to sudden freezing weather in the spring or early fall.



Potter wasp's mud nest

Ombudsman Tim Smith will respond to your questions, suggestions or complaints concerning Department of Conservation programs. Write him at PO Box 180, Jefferson City, MO 65102-0180, call him at 573-522-4115, ext. 3848, or email him at [Ombudsman@mdc.mo.gov](mailto:Ombudsman@mdc.mo.gov).

## Photo Tip of the Month: Lighting

I once heard someone say that to take good photos, always be sure to put the light at the photographer's back. The idea is that if the light is at the photographers back, then it is shining directly on the subject, thus illuminating it as much as possible for the photo. This is, with only a few exceptions, patently bad advice.

Quality and direction of light is one of the most important elements to consider as you craft a photograph. Light shining directly on your subject from roughly the same direction as the photographer, is typically going to be harsh and flatten out detail and contrast.

Light from the side or even behind your subject is going to yield much more pleasing results in most cases. Highlights and shadows created by lighting from an oblique angle will help emphasize detail, increase contrast and add depth to your image.

It is difficult to get directional lighting in the middle of the day, when the sun is directly overhead. That is why most photographers shoot during the hours right before and right after sunrise and sunset. During this time, the sun is low in the sky, and will shine on your subject in a more effective and directional way.

Shooting during the morning and evening hours will not only allow for directional lighting, but it will also help improve the overall quality of the light. During these times of the day, the sun is shining through a larger slice of the atmosphere. This has the effect of softening the light and warming up the color. Photographers often refer to this time of day as the "golden hours" because of the golden quality of the light.

Often cloudy days yield undesirable lighting conditions for good photos. However, there are a few exceptions when an overcast day is beneficial. Perhaps the best example of this is in flower photography. An overcast sky often helps soften shadows, saturate colors and bring out the subtle colors and details of a flower's petals. —Cliff White

## 75th Anniversary of Conservation Photo Contest, Enter till May 15!

Remember to get out those cameras and search those photo files for your best images that celebrate the natural wonders of Missouri and the 75-year legacy of MDC. A full list of rules and guidelines can be found on our website at [mdc.mo.gov/node/16689](http://mdc.mo.gov/node/16689). Entries will only be accepted via Flickr, an Internet photo sharing service, through May 15. If you are not on Flickr, it is easy to join. Just go to our 75th anniversary photo contest Flickr site for more information: [flickr.com/groups/mdc75thanniversary/](http://flickr.com/groups/mdc75thanniversary/). When you add photos to the contest group in Flickr, the photos MUST be tagged with the category you are entering. Please read the full list of rules carefully for more information. Photos that do not adhere to the rules will be disqualified.



White-tailed deer

📷 500mm f/4 lens + 2x converter  
f/4 • 1/250 sec • ISO 800

This photo of a deer is improved by the lighting conditions. The strong side-lighting and golden quality give this image more drama and depth, for a much stronger impact.

(continued from Page 5)

the spread of zebra mussels and other invasive species helps preserve those resources.

For information about how to prevent the spread of zebra mussels, visit [mdc.mo.gov/node/4681](http://mdc.mo.gov/node/4681).

## CWD Update

Test results received in March confirmed three additional cases of chronic wasting disease (CWD) in free-ranging deer in northwest Macon County.

Missouri's first cases of CWD in free-ranging deer were detected in two adult bucks harvested in northwest Macon County during the 2011 fall firearms deer season. The three most recent CWD positives were collected in February and March as part of intensive sampling to determine the extent and prevalence of CWD infection. They came from within two miles of the two previous wild-deer positives.

MDC collected samples from hunter-killed deer during the 2011 hunting season in response to two cases of CWD found in captive white-tailed deer at two private captive-hunting preserves in Macon and Linn counties. Since October 2011, three more captive deer at the Macon County preserve have tested positive for CWD.

The five cases of CWD in free-ranging deer have been found within two miles of the Macon County preserve. Depopulation, quarantine and other control measures at the private preserve are being coordinated by the Missouri Department of Agriculture (MDA).

Missouri's world-class deer hunting pumps millions of dollars into the state economy annually. Preventing the spread of CWD helps keep that economic engine running. MDC began testing free-ranging deer for CWD in 2002. With hunters' help, the agency has tested more than 34,000 free-ranging deer for CWD from all parts of the state. The positives from deer taken in the 2011 hunting season are the first sign of the disease in wild deer.

MDC staff is analyzing recent test results, continuing to evaluate efforts and lessons learned from other states with CWD and consulting with wildlife experts around the country. The main objectives are to limit the prevalence and restrict the spread of CWD in Missouri.

Resource Scientist Jason Sumners, who oversees MDC's deer-management program, says sev-

eral factors will influence future prevalence and distribution of CWD in Missouri. One is local deer population density. Greater population density increases the chances of animal-to-animal disease transmission. Another factor is conditions, such as drought or artificial feeding, that bring the deer together, again increasing opportunities for disease transmission. Finally, natural deer movement and movement of deer carcasses by hunters can help spread CWD.

"Yearling and adult male deer have been found to exhibit CWD at a much higher rate than yearling and adult females," says Summers. "Of the 10 cases of CWD identified in both captive and free-ranging deer in Missouri, eight have been in adult bucks. Natural dispersal of yearling males from the range where they were born is one of the most likely means of spreading CWD. The movement of infectious materials in the form of hunter-harvested deer carcasses that contain heads and spinal columns, where the disease concentrates, may also serve as a means of introducing CWD to other regions of the state."

Summers notes that CWD has been found in only one small pocket of the state.

"Our management efforts will focus on minimizing the prevalence and preventing the further spread of the disease from the area. We will keep the public informed as we develop those efforts."

MDC says there is no evidence from existing research that CWD can spread to domestic livestock, such as sheep or cattle. The Missouri Department of Health and Senior Services says there is no scientific evidence that CWD is transmissible to humans through contact with or the consumption of deer meat.

For more information about CWD, visit [mdc.mo.gov/node/16478](http://mdc.mo.gov/node/16478).

## Burying Beetle

Future visitors to southwestern Missouri might catch glimpses of one of North America's most fascinating insects, thanks to a partnership between the U.S. Fish and Wildlife Service, The Nature Conservancy, the St. Louis Zoo and MDC.

The U.S. Fish and Wildlife Service is reintroducing the remarkable (and remarkably pretty) orange-and-black American burying beetles, raised by the St. Louis Zoo, to The Nature Conservancy's Wah'Kon-Tah Prairie near El Dorado Springs. MDC

## Did You Know?

We help people discover nature.

### Visit a Conservation Nature Center Near You!

» **Conservation nature centers** across the state offer exhibits, walking trails and events to more than 850,000 visitors each year. Find a center near you to learn more about and enjoy Missouri's nature.

» **Anita B. Gorman Discovery Center**, 4750 Troost Avenue, Kansas City, 64110, 816-759-7300, [mdc.mo.gov/node/281](http://mdc.mo.gov/node/281)

» **Burr Oak Woods Conservation Nature Center**, 1401 Northwest Park Road, Blue Springs, 64015, 816-228-3766, [mdc.mo.gov/node/280](http://mdc.mo.gov/node/280)

» **Cape Girardeau Conservation Nature Center**, 2289 County Park Drive, Cape Girardeau, 63701, 573-290-5218, [mdc.mo.gov/node/297](http://mdc.mo.gov/node/297)

» **Powder Valley Conservation Nature Center**, 11715 Cragwold Road, Kirkwood, 63122, 314-301-1500, [mdc.mo.gov/node/271](http://mdc.mo.gov/node/271)

» **Runge Conservation Nature Center**, Highway 179, Jefferson City, 65102, 573-526-5544, [mdc.mo.gov/node/296](http://mdc.mo.gov/node/296)

» **Springfield Conservation Nature Center**, 4601 South Nature Center Way, Springfield, 65804, 417-888-4237, [mdc.mo.gov/node/287](http://mdc.mo.gov/node/287)

» **Twin Pines Conservation Education Center**, Highway 60 (1.3 miles east of junction Highway 19) Winona, 65588, 573-325-1381, [mdc.mo.gov/node/293](http://mdc.mo.gov/node/293)

manages the 3,000-acre prairie area, another example of public-private partnerships to restore and sustain healthy wildlife populations.

The American burying beetle (*Nicrophorus americanus*), has some of the most elaborate social and behavioral adaptations in the insect world. As their name implies, they bury dead animals. After fighting off other burying beetles, the baddest beetle on the block uses its large size (up to 1.5 inches) to excavate a hole large enough to contain its prize, which may be as large as a mourning dove. Getting the carcass underground excludes ants, flies and other critters that might steal the beetle's hard-won spoils.

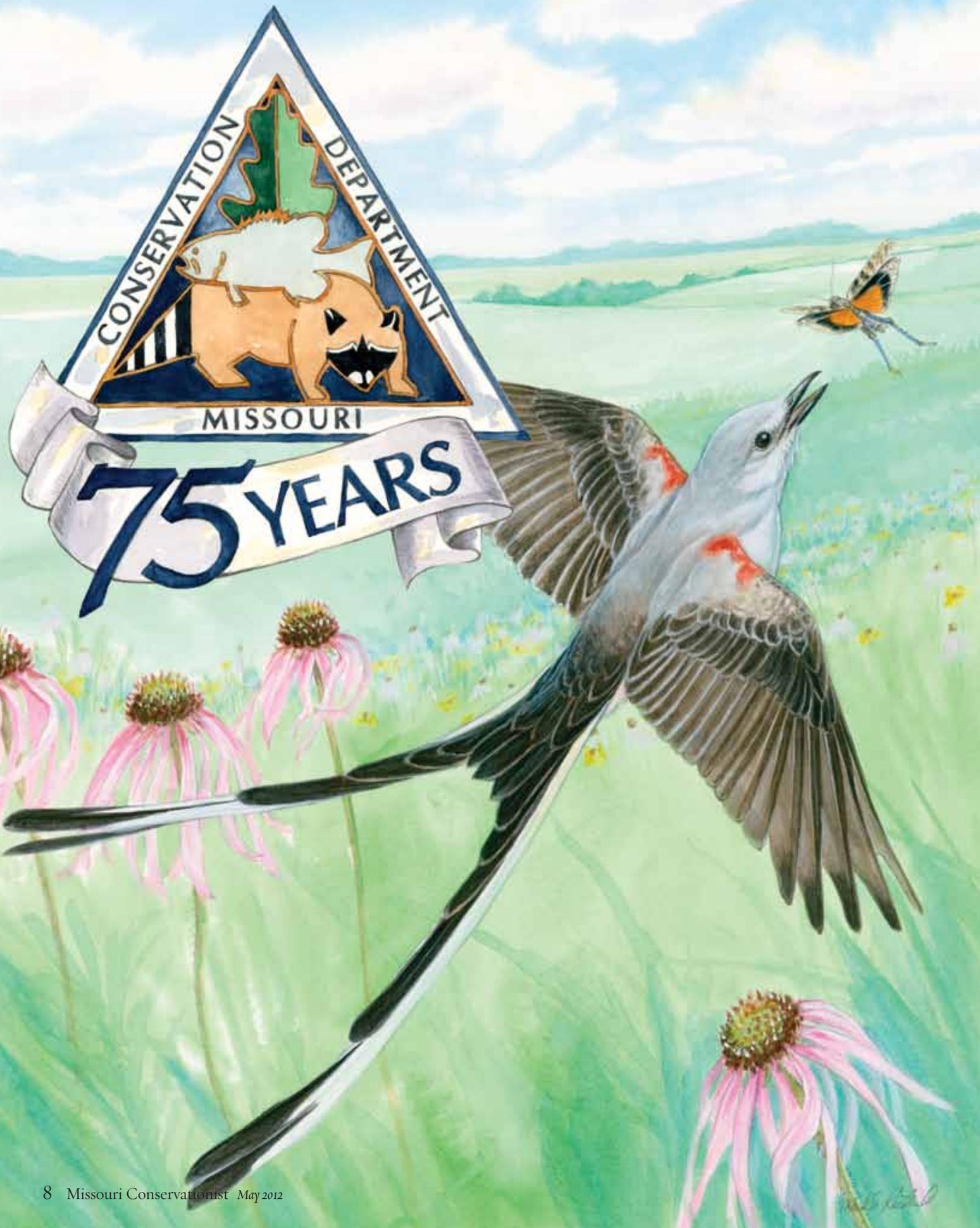


Next, the beetle and its mate enclose the carcass in a capsule, using secretions that inhibit fungal and bacterial action. This not only preserves the food value of the animal, it also minimizes odors that might attract scavengers.

The female lays eggs near the encapsulated corpse. When the eggs hatch, the larvae crawl into a cavity prepared by their parents and begin consuming the food so carefully preserved for them. Burying beetle parents also bring food to their young and guard them until they mature.

To give area managers greater flexibility, the U.S. Fish and Wildlife Service has designated the American burying beetles at Wah'Kon-Tah Prairie and surrounding counties as a "nonessential experimental" population. This also assures neighboring landowners that the presence of a protected species will not affect their activities.

American burying beetles once inhabited 35 states, including Missouri. Missouri's last known wild American burying beetle was found in Newton County in the mid-1970s. For more information about endangered species, visit [fws.gov/midwest/endangered](http://fws.gov/midwest/endangered).





**F**OR THE PAST 75 YEARS, MDC HAS been developing an extensive network of conservation areas. These are the places we go to hunt, fish, hike, bird watch and enjoy nature. The Department's aim has been to balance conserving and managing the state's forest, fish and wildlife resources while providing ample opportunities for all citizens to use, enjoy and learn about them.

"Conservation areas belong to the people of Missouri and are for their benefit. These areas have always provided room for people to enjoy the outdoors," says MDC Director Robert L. Ziehmer. "They also do much more. We manage these areas to re-establish habitats for native species and to protect unique natural communities, which results in a wider range of ways that the public can benefit from these areas."

## DESIGN FOR CONSERVATION

Missourians have long supported conserving lands for public use and to support wildlife. Beginning in the 1970s, the Department made a pledge to embrace a broader conservation approach called the Design for Conservation. It was a plan to preserve the best examples of forests, prairies, marshes and glades; to obtain land

## CONSERVATION AREAS FOR NATURE AND YOU

MDC's public land stewardship goals balance the needs of wildlife and people. "The Department has planned and implemented one of the best long-term public land strategies in the nation," says MDC Deputy Director Tim Ripperger.

MDC's public land stewardship goals aim to achieve the following:

- To provide the land base necessary to assist in the conservation of the state's forest, fish and wildlife resources.
- To identify, acquire, protect and manage Missouri's most significant land and water resources for appreciation and use by future generations.
- To preserve Missouri's outdoor heritage through public access.
- To promote hunter and angler recruitment while providing outdoor education opportunities, as well as providing outdoor and resource-related recreation.



Eastern collared lizard

**Glades harbor some of Missouri's most interesting organisms. Nowhere else in the state can you find roadrunners, prickly pear cacti and collared lizards.**

for recreation, forestry and protection of critical habitat; to increase services to the public in the areas of wildlife and forest conservation; and to create a system of conservation nature centers throughout Missouri. Voters approved the Design for Conservation plan in 1976 with a one-eighth of 1 percent sales tax, providing reliable funding for fish, forests and wildlife conservation.

"This citizen-led initiative created an interconnected and accessible network of public lands that conserve natural resources while providing the public with quality recreational and educational opportunities," says MDC Deputy Director Tim Ripperger.

Prior to Design for Conservation, the Department managed 294,000 acres of public land. During the initial 20 years of implementing the Design, the Department purchased an additional 440,000 acres to serve as conservation areas. These early efforts were based on broad guidelines and willing sellers. While the combined acreage of Missouri's conservation areas is remarkable, it totals less than 3 percent of the state.

Incredibly, a full 20 percent of MDC's public land holdings were donations. "Donations of land are the ultimate expression of the commitment to conservation and to the future that a landowner can make," Ripperger says.

Today the Department holds approximately 789,000 acres in public trust and manages another 197,000



Rock pink flower on Wildcat Glade Natural Area in Joplin

acres owned by conservation partners, such as the U.S. Army Corps of Engineers, The Nature Conservancy and others. The Department's emphasis has shifted away from acquiring substantial new acreage, and is now more focused on improving infrastructure and access to existing conservation areas, as well as ongoing efforts to manage habitat to benefit wildlife. The land acquisition budget back in 1979–87 averaged 29 percent of the Department's budget. Today, land acquisition comprises less than 1 percent of the Department's annual budget.

#### MANAGING CONSERVATION AREAS FOR WILDLIFE AND PEOPLE

To benefit the greatest number of wildlife species, MDC maintains a high level of active management on conservation lands—especially for quail and grassland birds. In 2011, this included habitat-management activities on nearly 185,000 acres, including: 43,000 acres of wetlands; 21,000 acres of woodlands, forests and savannas; 76,000 acres of croplands (including 12,000 acres of food plots); 24,000 acres of grasslands and prairies; 20,000 acres of old fields; and 1,000 acres of glades.

**Unfortunately, many glades in Missouri aren't healthy. Land-use practices have destroyed many of Missouri's "mini-deserts," and fire suppression has degraded others. The Department is hard at work on conservation areas and with private landowners to restore glade habitat by removing invasive trees and setting periodic controlled fires.**

"MDC intensely manages a number of conservation areas for increased hunting opportunities for rabbit, squirrel, dove and quail in an effort to recruit and maintain a strong hunting heritage," says DeeCee Darrow, MDC wildlife division chief.

The Department continues to rehabilitate five of the state's oldest wetland conservation areas: Fountain Grove, Duck Creek, Montrose, Schell-Osage and Ted Shanks. Ted Shanks Conservation Area (CA) restoration is complete and future development plans are underway for sections owned by the U.S. Army Corps of Engineers. Work at Fountain Grove CA is nearing completion and initial planning efforts are underway

at Montrose CA. Learn more about Missouri's public wetlands at [mdc.mo.gov/node/4222](http://mdc.mo.gov/node/4222).

The Department manages 440,000 acres of public forestland on conservation areas throughout the state. Last year, MDC completed more than 49,880 acres of active management, including forest inventory, tree planting, timber sales, forest stand improvement, wildlife-management practices, and glade and savanna management.

"The Department also stewards the state's forests by leading statewide wildfire-suppression efforts," says Lisa Allen, Missouri state forester. "MDC foresters work with more than 770 fire departments to offer training, provide fire equipment grants and promote wildfire-prevention activities."

MDC's conservation area management continues to connect citizens with nature through the recent completion of the following major construction projects: Eminence City Park access, Eagle Bluffs CA office and draw room, Kansas City Regional Office, Central Regional Office, improvements to the Shepherd of the Hills, Lost Valley and Roaring River hatcheries, Powder Valley Conservation Nature Center, the Jay Henges Shooting Range renovation, Roaring Rivers Fish Hatchery improvements and levee work at Ten Mile Pond CA.



**To benefit the greatest number of wildlife species, MDC maintains a high level of active management on conservation lands—especially for quail and grassland birds. In 2011, this included habitat-management activities on nearly 185,000 acres.**



**Prairie blazing star at Pawnee Prairie Natural Area**

The Department also works to improve access to the outdoors in other ways. "More Missourians enjoy the outdoors because of MDC's managed hunts and the construction of disabled-accessible docks, hunting blinds and trails," says Darrow. "Special hunting and fishing events for people with limited mobility provide additional opportunities for people of all ages to pursue outdoor activities and to learn first-hand about conservation."

### MISSOURI'S CROWN JEWELS

Another way the Department works to steward Missouri's forest, fish and wildlife resources is by conserving the best remaining examples of Missouri's rich and varied forests, woodlands, savannas, prairies, glades, cliffs, wetlands, caves, springs, streams and rivers. This effort began in 1970. Today, the state more than 180 designated natural areas in the Missouri Natural Areas Program, totaling 72,060 acres.

"The success of the Natural Areas program is due to an outstanding conservation partnership between MDC, the Missouri Department of Natural Resources, the Mark Twain National Forest, the Ozark National Scenic Riverways, the U.S. Fish and Wildlife Service and



## MISSOURI PRAIRIE FOUNDATION: CONSERVING PUBLIC PRAIRIES

Tallgrass prairie once covered 15 million acres of Missouri—nearly one-third of the state. Today, less than 1 percent remains. Our prairie remnants are stunning in their ecological wealth and complexity—they provide habitat for hundreds of plant species, thousands of invertebrates (including as many as 400 different pollinating insects) and dozens of animals.

The Missouri Prairie Foundation, the Department, The Nature Conservancy, the Missouri Department of Natural Resources and other groups own approximately 30,000 acres of original and restorable prairie. These areas are maintained for the public to enjoy and to ensure that prairie is forever a part of Missouri's natural heritage.

The Missouri Prairie Foundation partners with other conservation groups and private landowners to enable the restoration and management of prairie on a larger scale than any one group or individual could accomplish alone. In 1998, the Foundation spearheaded the formation of the Grasslands Coalition—20 conservation groups and private landowners working together to pool resources and make a lasting impact on native grasslands and the animals that live there.

The Foundation works with landowners to improve prairie habitat, share technical knowledge and leverage funding for restoration work. In one example, the Foundation recently completed a three-year \$70,000 grant from the U.S. Fish and Wildlife Service to restore native prairies and manage grasslands in the Mystic Plains Conservation Opportunity Area in Adair and Sullivan counties. The Foundation partnered with the Department and private landowners to improve more than 2,000 acres by eliminating woody cover, removing fences, resting hay fields, controlling invasive species and assisting with prescribed fires. This resulted in greater prairie species diversity, expanded open vistas and created more continuous habitat needed by grassland birds and other wildlife—for less than \$55 an acre.

Join in the fun at the Foundation's annual Prairie BioBlitz, where outdoor enthusiasts can become "weekend citizen scientists" by discovering and documenting plant and animal species on a prairie. This event increases biological knowledge of prairies and generates greater interest in Missouri's native grasslands. Learn more at [moprairie.org](http://moprairie.org).

of outdoor recreation, including hiking, nature photography, bird watching, nature study, hunting and fishing. Learn more about natural areas at [mdc.mo.gov/node/2453](http://mdc.mo.gov/node/2453). Or, purchase *Discover Missouri Natural Areas: A Guide to 50 Great Places*, available at MDC conservation nature centers statewide (see Page 7) and at [mdcnatureshop.com](http://mdcnatureshop.com).

### MDC PARTNERS WITH COMMUNITIES

In addition to actively managing the state's conservation areas to benefit people and wildlife, MDC also partners with communities to improve access to the out-

**To see a shining example of nature in its purest, wildest, best-functioning form, visit a natural area. The Missouri Natural Areas Program—a partnership of the Conservation Department and other agencies—safeguards more than 180 natural areas across the state.**

The Nature Conservancy," says Michael Leahy, MDC natural areas coordinator. "These organizations have come together with the common goal of conserving the natural communities of Missouri for the enjoyment and benefit of today's citizens and future generations."

These habitats support many native plant and animal species. Missouri natural areas provide habitat for more than 350 Missouri species of conservation concern, including endangered species such as the Niangua darter and the western prairie fringed orchid. Designated natural areas also conserve multitudes of species that are not endangered but are uncommon due to habitat loss. In this way, natural areas help to keep species off of the endangered species list by ensuring these plants and animals have the habitat they need.

Designated natural areas help connect us to our outdoor heritage. They provide opportunities for many forms

doors, especially fishing. Since 1981, the Department's Community Assistance Program has provided close-to-home fishing opportunities throughout the state.

"These programs benefit our partners and the local communities by providing an extremely cost-effective way of providing citizens with more quality fishing and boating opportunities," says Marlyn Miller, the Department's fisheries programs supervisor.

The Department has cooperative agreements with 117 partners to manage 168 public lakes, 42 stream access areas, four lake access areas and nine aquatic resource

**MDC also offers many managed hunting opportunities for tens of thousands of Missourians. Last year, the Department offered 88 managed deer and turkey hunts, managed waterfowl drawings, 14 youth hunts and 12 managed hunts specifically for disabled hunters. Learn more about managed hunts at [mdc.mo.gov/node/3867](http://mdc.mo.gov/node/3867).**

education ponds. At 78 of these lakes and streams, MDC developed or improved motorboat access thanks to the Federal Aid in Sport Fish Restoration Program, which funds up to 75 percent of total project costs.

The Department strives to provide high-quality fishing opportunities for all Missourians, including those living in urban areas. MDC's Urban Fishing Program stocked more than 50 ponds in St. Louis, Kansas City, St. Joseph, Sedalia and Springfield with trout, channel catfish and sunfish.

"Department surveys have found that the majority of the anglers at these lakes fish nowhere else," Miller says. "MDC is providing fishing opportunities to people who may not otherwise venture out of the city to fish."

### CONSERVATION AREA STEWARDSHIP CONTINUES

Missouri's rich history of supporting conservation efforts now benefits people and wildlife throughout the state. "The majority of Missourians feel the Department



Youth dove hunting

## THE NATURE CONSERVANCY

The Nature Conservancy and MDC have a long history of working together, sharing resources and knowledge to help achieve the conservation goals of both organizations.

In the Current River watershed, for example, MDC and the Conservancy team up to implement prescribed fires, which improve native habitat, watershed quality and reduce the threat of severe wildfires. This watershed is a top priority for both groups, as it provides habitat for an incredible array of native species and supports local economies through the timber and tourism industries.

This partnership has also created an “outdoor laboratory” along the Current River at the Conservancy’s Chilton Creek Preserve, where a long-term research and land management collaboration is assessing the effects of fire and other practices in woodland restoration. This research provides valuable information for conservation groups and other landowners.

“The cooperation and coordination between The Nature Conservancy and MDC also allowed for a significant expansion of the Sunlands Natural Area, which features the longest

sinkhole in Missouri, unusual sinkhole pond marshes, remnant shortleaf pine woodlands and over a dozen rare species of plants and animals,” says Michael Leahy, MDC natural areas coordinator.

The vast majority of land in the Ozarks is privately owned. In some instances, however, MDC and the Conservancy partner to acquire unique habitats that are managed as public land for the benefit of both nature and people—such as the 83,000 acres obtained in 1991 from the Kerr-McGee Corporation.

“For nearly half a century, the Conservancy and MDC have partnered to the benefit of Missouri’s forest resources,” says Todd Sampsell, Missouri state director for the Conservancy. “Missourians are fortunate to have an abundance of healthy, productive forests, and we value MDC’s expertise and commitment to sustaining this natural heritage for future generations.”

MDC and the Conservancy also work with private landowners to help keep their lands economically productive, while at the same time providing conservation benefits such as watershed protection or improving natural habitat. Along the Meramec River, the two organizations assisted rancher Susan Wallach with the installation of a crossing over the



**The Nature Conservancy and MDC team up to implement prescribed fires, which improve native habitat.**

Meramec River. The crossing connected Susan’s pastures, allowing cattle, trucks and farm equipment to cross the stream safely. The crossing also prevented sediment and nutrients from entering the Meramec.

“As a people, we all depend on healthy natural systems to sustain our economy and quality of life,” says Doug Ladd, the Conservancy’s director of conservation science. “To conserve these resources for the benefit of present and future generations, our society must weave conservation into the fabric of everyday life, building on partnerships such as the one between MDC and the Conservancy.”

Learn more at [nature.org](http://nature.org).

is doing a good or excellent job of providing services to them, their families, the community and the state,” says David Thorne, MDC policy supervisor. “According to recent surveys, 91 percent of Missourians agree that it is important for outdoor places to be protected, even if you don’t plan to visit the area. And 75 percent of Missourians agree that land should be acquired for fish, forest and wildlife conservation.”

MDC is committed to ensuring that Missouri’s public land stewardship continues to balance the needs of people and wildlife. “By focusing on partnerships and being adaptable, we can continue to build upon Missouri’s quality land conservation history and boldly advance the Department’s land conservation and stewardship,” Ripperger says.

Together with Missourians, MDC will continue a land-conservation heritage that will protect key natural resources, continue to improve access and opportunities for people to enjoy these areas, continue to support our outdoor heritage, and provide educational opportunities for future generations of Missourians. ▲



**Missouri’s public lands and nature centers, such as Powder Valley Conservation Nature Center near St. Louis, provide room for people to enjoy the outdoors.**

# Destination Discovery

Family nature outings in  
your own neighborhood

by GLADYS J. RICHTER  
photos by NOPPADOL PAOTHONG





**W**ITH CLEAR MASON JARS in hand, we headed outdoors on our appointed mission. Soon, thanks to some local fireflies and quick hands, we delighted in the twinkling glow of our natural lanterns. Thus began another memorable summer of discovery in the Missouri Ozarks.

This is the stuff many childhood memories are made of—fireflies, cicadas and warm evenings filled with the sounds of tree frogs, katydids and whip-poor-wills—adventures galore in our own backyard.

For families with young children, getting acquainted with nature close to home can be an inviting and rewarding experience. Getting started doesn't have to be complicated or require long treks over rugged terrain. Nature discovery can take place right in your own backyard, nearby creek, forest or nature center.

### Backyard Safari

Television glamorizes exotic big-game locations, complete with lions, tigers and bears, but even the smallest backyard is home to wild beasts perfect for pint-sized naturalists to observe. Among the blades of grass, hardy dandelions and flint rocks there are ant lions, tiger swallowtails and woolly bear caterpillars.

To help your child learn more about nature before heading outdoors, sign them up to receive our kids' magazine *Xplor* at [Xplormo.org](http://Xplormo.org) or see Page 3 for more details.



**Around gardens there is an awesome number of crawling creatures such as turtles. Before you head outdoors, learn more about turtles in Missouri at [mdc.mo.gov/taxonomy/term/992](http://mdc.mo.gov/taxonomy/term/992).**

Insects are everywhere, and there are so many kinds. Beneath rocks, among weeds and around gardens there is an awesome number of these crawling, jumping and flying creatures. Insect investigation is at the top of the list for many preschoolers. Add a magnifying glass and your little ones are sure to have hours of fun. Just be sure to watch out for insects that sting or bite. Help your children identify those that can sting, such as bees and wasps, and teach them to calmly give them space and respect.

Bushes, trees and gardens provide prime daytime birding. Watch for local and seasonal visitors as they go about their daily routine of bathing in driveway puddles, catching insects and feeding their hungry young. Even your 2- or 3- year-old can keep count of the different bird songs heard or nests found in trees. Colorful cardinals, beautiful bluebirds and cheerful chickadees are some classic favorites for both kids and adults. Put out some seed, fruit or suet and see who shows up for dinner.

At night, fireflies “talk” to one another using only their “taillight signals,” while bats, owls and nighthawks seek their prey on the wing. Many yards harbor at least one of these nocturnal creatures, and you may want to watch for them on a backyard camp-out, complete with tents, flashlights, sleeping bags and s'mores. Camping in your own home yard is also a great way to prepare for future vacation adventures further away. For your toddler or preschooler it is exciting, yet feels safe and familiar.





## Invite Wildlife Into Your Yard

It is amazing what you may discover when a portion of your lawn is not mowed for a while. Grasses and wildflowers produce flower heads and seeds feasted upon by hungry insects and migrating birds. Go one step further and start a few native garden plants, put up a bird or bat house or just add a couple of large rocks to create your own small nature viewing station. Your area may serve as a caterpillar diner where you may observe the entire life cycle of some of our state's moths and butterflies.

Food and water attract a colorful crowd for your family to enjoy year-round. A simple bird-bath can be made using an old terra cotta planting pot and a wide ceramic soup bowl. Just turn the planter upside down and place the bowl on top of the pot. Fill the bowl with fresh water and enjoy your visitors on a hot summer day.

## Take a Tree Trek

Once acquainted with your home safari, why not branch out and take a tree trek around

your neighborhood or along your local walking trail. No matter the time of year, trees are always in season.

In the spring, trees come alive with buds, blossoms and winged seeds. Maple trees provide endless hours of fun with their millions of "helicopter" seeds, and redbud, dogwood and sassafras create splashes of color amongst the bare branches of winter. Ripening mulberries and wild plums add flavor to summer, while persimmons provide the opportunity for tasty baked-good additions in early fall. Native trees such as walnut, pecan, hazelnut and hickory all have edible nuts that are sought after by both wildlife and hungry wildlife observers.

Make a "treasure map" using trees you have identified along a trail and a few other natural landmarks. Mark your treasure with an "X." Your treasure find may be a picnic spot, campsite or secret fishing hole.

A crayon, a piece of scrap paper or paper grocery bag and some leaves of varying shapes

**Insect investigation is at the top of the list for many children. Add a magnifying glass and your little ones are sure to have hours of fun. Help your child learn more about Missouri insects with the *Show-Me Bugs* book available at nature centers statewide or at [mdcnature.com](http://mdcnature.com).**



**Nature center staff has information about upcoming free programs to help your family learn more about the outdoors. See Page 7 for a list of conservation nature centers around the state.**

and sizes create lovely artwork suitable for use as decorative framed art or holiday wrapping paper. Leaf rubbings help small children learn cause and effect relationships. For a little natural magic, repeat after me, "If I rub my crayon over this paper with a leaf under it, a picture of a leaf appears!"

### Check Out Some Alligator Bark

Winter may seem like a down time for trees, but less foliage means better observations of woodpecker holes, tree gnarls, insect galls and tree bark itself. Many trees can be identified by the texture and color of their bark. Wild persimmon trees have very distinctive, blocky bark that is often compared to that of an alligator's rough-textured skin. Other trees with easily distinguished bark include American sycamore and river birch. Look for their flaky trunks along rivers and creeks.



### Go on a Creek Walk

Creeks, no matter the size, are havens of discovery. Fish, frogs, turtles, dragonflies, water striders, herons and crawdads are only the begin-

ning. Children of all ages enjoy using a dip net to catch a few water critters to observe. Placed gently in a white tub or other container and viewed with a handheld magnifying glass, water beetles, snails and minnows provide hours of endless learning and fascination. After a few minutes of observation, remember to release aquatic creatures back into their watery home.

No water, no problem! Even a dry streambed can be a discovery destination. With millions of rocks in a multitude of colors, shapes and sizes, most youngsters claim a few favorites. The possibility of finding a fossil or two makes it a perfect pastime. If a fossil is discovered, most want to know more about the life of the featured plant or animal from eons ago.

### This Center's for You

If your little naturalist needs to know more, check out your nearest conservation nature center for some answers (see Page 7). It is a great way to spend an hour or a day. Missouri has several conservation nature centers and conservation areas statewide. Regardless of where you live in Missouri, there is a nature center not too far from your home. Each site has its own unique mix of naturalist-led programs, live native animals, hiking trails and accessible site features.

Conservation nature centers provide information on Missouri's fish, forests and wildlife. At your local center you can find out more about your backyard discoveries—fossils, bugs, bats and more. A day trip to a center near you allows your entire family the opportunity to explore more of Missouri's wild side in a safe environment.

Nature center staff can get you started with information about upcoming free programs to help your family learn more about the outdoors. (You can also find these on our website at [mdc.mo.gov/regions](http://mdc.mo.gov/regions).) Topics such as animal tracks, backyard bird feeding, native gardening and nature-themed scavenger hunts await you. Conservation topics such as archery, angling and trapping may appeal to your children as they grow.

### Keep it Simple and Safe

No matter your destination, remember to keep it simple and make safety a priority. Watch out



for things such as poison ivy, insect bites and sunburn. Keep a first aid kit with you for those unexpected scrapes and stings.

If your discoveries include streams, ponds or lakes, observe water conditions and wear life jackets. While hiking, be sure to stay on designated trails, and don't forget to take along plenty of water and your little explorer's favorite snacks. Even though your child is full of energy, remember to take frequent breaks. Young children can tire easily on an outing. In winter, dress in layers for comfort and to prevent hypothermia.

Planning ahead makes a big difference. Simple outings lead to big fun for everyone.

So get out and head for your family's next close-to-home discovery destination and enjoy Missouri outdoors. ▲

**Nature discovery doesn't have to be complicated or require long treks over rugged terrain. It can take place right in your own backyard, nearby creek, forest or nature center.**



# **TROUBLED TREES**

DIAGNOSING AND MANAGING  
URBAN TREE STRESS

by NICK KUHN



**This oak tree's color  
is changing too early,  
indicating it is sick and dying.**

NOPPADOL PLOTHONG

**T**REES CAN BE STRESSED BY CITY life just like us. Cars, pollution, home improvement projects that take too long, summer heat and other factors cause urban trees to live significantly shorter lives than trees growing in natural settings.

Urban tree stress affects trees in your community parking lots, streets, parks, your home and anywhere city conditions cause less than desirable factors for tree health and safety. Unlike an insect infestation or vascular disease that can be managed with a single treatment option, urban tree stress almost always requires a comprehensive approach.

Knowing what to look for, and the right questions to ask, will help you gather the information that a Department of Conservation expert or your local private arborist needs to understand and help your tree.

### How Stress Hurts Trees

Trees, like all living things, have adapted to thrive in certain conditions. They prefer a specific soil type, nutrients, space, moisture, temperature and associated soil food web to reach their full potential. When a tree is taken from an environment to which it has adapted and is placed in a sidewalk tree well, for example, one or more of these needs is reduced or lost. This places stress on the tree and, subsequently, the tree

**Compacted soil has caused a girdling root and will eventually choke the trunk of this urban tree.**



Oak leaf

**Knowing possible stressors will help identify future problems and treatments for trees. Window-pane insect feeding is common and usually does not harm the tree.**

will not be able to thrive. Stressed trees become more susceptible to common problems such as fungus, insects and diseases. Tree pests that are minor issues in the woods become major issues in urban trees.

Many Missouri trees can be used in urban environments when the right tree is put in the right place and is protected from avoidable health problems. Knowing what trees need, and the possible stressors for those trees, will help identify future problems and treatments.

Urban tree stress is usually the result of a combination of factors and each species of tree varies in its inherent ability to resist these factors. Trees such as linden, elm and some oaks are well known for their hardiness in urban landscapes because they are able to thrive in difficult growing situations. The factors that create these difficult growing situations include competition with turf grass, compaction, nutrient-poor soils, under- and over-watering, temperatures too hot or too cold, pollution, improper planting, construction damage and heat-island effects. Age also plays a contributing role in the susceptibility to stress; newly planted trees, as well as older, mature trees, are most likely to be negatively affected. Root loss from construction damage such as grade changes, root cutting, or even driving over the



## SOME FACTORS THAT CONTRIBUTE TO URBAN TREE STRESS

- Drought
- Reflected heat
- Soil compaction
- Freezing / warming fluctuations
- Defoliation
- Nutrient deficiencies
- Chemical injury
- Over-watering
- Mechanical damage
- Transplant shock
- Improper planting depth
- Lack of root space
- Competing vegetation
- Improper pruning

roots, is a significant source of stress for trees of all sizes and ages. Reflected heat from nearby buildings, asphalt and concrete will make a tree and soil hotter and drier. Mulch volcanoes, the practice of mounding excess mulch against a tree trunk, encourage pests and fungus. The more of these factors a tree has to overcome, the more difficult it is for that tree to survive, even for the hardiest of species.

## Diagnosing Your Trees

Symptoms of urban tree stress may differ by species, location, age and source of the stress, but there are many common factors. Look for stunted growth, excess stem sprouting, wilted and scorched leaves, and chlorosis (yellowing leaves due to nutrient problems). Other visual indicators may include bark cracks, cankers, decay and the sudden or increased presence of insect pests. A dramatic increase in fruit and seed production is a signal that a tree is under stress, as trees in decline often increase seeding as a final effort before they die. Harder-to-see symptoms include construction damage and infection by root-rot diseases. These may be identified by certain fungus growing in your yard.

Be aware that many of these symptoms may not occur until several years after the cause. The healthier a tree is, the more capable it is to fight off problems over time, but delayed reactions to minor and major problems are normal. The key is to assess not only the tree, but also the area

**Early color change indicates a stressed tree. Metal grates for the sidewalk will eventually pinch the tree and restrict the flow of water and nutrients.**



**These trees were planted too deep and the burlap was left on. Because of this, trees die from the top down. The roots can't get enough water, so the part of the tree furthest from the roots dies first.**

around the tree and its history, such as when herbicides were applied on the turf, a water line was fixed or the last time it rained.

### Caring For Your Trees

When it comes to managing urban tree stress, preventing problems is far easier and cheaper than curing them. Urban tree stress can be avoided by the addition of mulch, removing turf under trees, increasing soil aeration and nutrient availability, or reducing competition. The closer you can recreate natural conditions for an urban tree, the better chance it has to thrive. For example, a willow or cypress tree needs to be placed in a wet site, while a pin oak or pine needs acidic soils.

The cause of the stress and subsequent decline needs to be identified before management begins. If a tree is treated for boring insects

### TYPICAL SYMPTOMS OF URBAN TREE STRESS

- Excess sprouts
- Leaf scorch
- Wilted leaves
- Dead parts
- Stunted growth
- Increased fruit production
- Chlorosis
- Girdling roots
- Early fall color change
- Early leaf drop

when the real problem is drought, we will only temporarily fix the symptom but not provide a solution. Fertilizers added during drought or after construction damage are common, but the fix is only temporary and may only create other problems. Once the problem is identified, a plan should be implemented to address both the symptoms and the primary problem.

### What You Can Do

Watch for small changes in the appearance and growth of your trees, these may be early warnings. Take pictures so you have something to compare to later.

Lots of trees can recover from minor stress if provided a little extra water. Infrequent, slow and deep watering simulates natural rainfall, giving the tree a nice big drink. Mulch applied 2–4" deep, over the largest area possible, is similar to the natural leaf litter you see in the woods. This keeps soil cool, adds nutrients and keeps the mower from hitting the trunk.

If considering a remodeling project, don't cut roots because the guy with a trencher or backhoe says it is OK. A small delay until fall or winter



**Oak borer**

### WHAT IS BUGGING YOUR TREE?

Urban stress can lead to insects. Sometimes the insects are easy to see and sometimes all you see is the damage they cause. For a faster and more accurate diagnosis, collect the following information to share with your arborist.

- Do you see insects? What do they look like? What color are they? How big? Are they flying or walking? Do you see them in a web?
- Are leaves chewed or do they look like something poked a hole and sucked the juice out? Does it look like something tunneled inside the leaf?
- Is the leaf dried out? Are the edges dry or the whole leaf?
- Is the leaf turning yellow from the veins outward or from the edges in?
- Are there weird bumps or warty-looking things on a twig or leaf? Are the leaves or area under the tree sticky?
- Take a picture of the problem from close up and another showing the tree and area surrounding it.

can reduce problems. Sometimes patience, and considering the basics, such as water and mulch, are your best choices.

### What a Professional Can Do

A professional arborist is the best choice when you are worried about the health of your tree. Arborists can assess your trees with the knowledge of the whole region and provide the best information and recommendations. They may use compressed air excavation to loosen compacted soil or to find roots before a construction project. They may also apply soil, nutrients, growth regulators or other chemicals for specific problems. Arborists can make protection plans to work within your construction project needs. Those site and tree-specific options make hiring a certified arborist a wise choice. Visit the International Society of Arboriculture's website at [isa-arbor.com](http://isa-arbor.com) and look for "verify an arborist" to find a certified arborist in your area.

### It Works!

Keeping an eye on your trees will maximize their health, appearance and services provided to you. A healthy tree is safer, makes more shade, grows faster and can tolerate heat waves, high wind, droughts and other urban stress.

Trees at your home and in the community provide real economic value by shading your house, protecting or adding value to property, providing pedestrians safe areas from traffic and cleaning the water before it reaches our streams and lakes all over Missouri. Visit [itreetools.org/design](http://itreetools.org/design) to find out what trees do for you.

Many urban tree stressors can be avoided by placing the right tree in the right place for the right reasons. Be nice to your trees and they will be nice to you. Contact your local MDC urban forester (See regional phone numbers on Page 3) or visit [mdc.mo.gov/node/3797](http://mdc.mo.gov/node/3797) for more information. ▲

**Trees at your home and in your community provide real economic value by shading your house, providing pedestrians safe areas from traffic and cleaning the water before it reaches our streams and lakes.**



Forest Park in St. Louis

## Shooting Star

*This member of the primrose family brings a shot of color to open, sunny areas and pollen to bees.*

FOUND THROUGHOUT THE Ozarks and our northeastern counties, shooting star is recognized by many Missourians because of its meteoric flowers. The closely pressed together yellow stamens protrude out the front of each flower and the petals are swept backward, reminiscent of the trailing streak behind a meteor. The bases of the petals are also yellow, but the remainder of the petals can be white or varying shades of pink. The flowers occur at the top of a rigid stem that is about 18 inches tall. The leaves, which are up to 6 inches long, are all clustered at the base of the stem and both leaves and stem are smooth and without hairs.

Shooting star is a plant of prairies, glades and somewhat open woodlands on bluffs and high slopes. It thrives in full sun on the open prairies and glades but tolerates light shading in woodlands. It tends to be scattered in open habitats but it's often found in colonies in wooded sites. Because of its early spring growth, it receives considerable light even in the woodlands, before the deciduous trees leaf out fully each spring. With blooms that peak in May, the species completes its life cycle early in the growing season, producing its fruits with tiny seeds before the arrival of the hot, dry Missouri summer. Although the May flowers are oriented downward, the flower stems will change direction as the fruits develop, leaving the mature fruit capsules pointed skyward by late June.

Several types of bees visit flowering shooting stars to collect pollen and many photos of the flowering plant will include a bumblebee dangling upside-down from one of the flowers.

Botanists know this shooting star as *Dodecatheon meadia*, a member of the primrose family. It is much more commonly encountered than its two close relatives, French's shooting star and amethyst shooting star, both of which are considered species of conservation concern in Missouri. The Latin name is from the Greek "dodeca" and "theos," referring to twelve gods that were believed to care for the primroses. "Meadia" commemorates the English physician Dr. Richard Mead (1673–1754), who was a patron of early botanical exploration in North America. Other common names for the plant include bird's bill, mosquito bills, mad violets, sailor caps and American cowslip.

Shooting star is sometimes used as a native wildflower in home landscape plantings and is available from native plant specialty nurseries. It tolerates soils with dry to average moisture and needs full sun or light shade.

—Tim Smith, photo by Noppadol Paothong

 100mm lens • f/9 • 1/250 sec • ISO 400

*We help people discover nature through our online field guide. Visit [mdc.mo.gov/node/73](http://mdc.mo.gov/node/73) to learn more about Missouri's plants and animals.*





## Bluff Springs CA

*May is a great time to watch birds and identify wildflowers at this wooded area in Cedar County.*



IF YOU LOVE to watch birds, identify wildflowers and photograph nature, grab your gear and spend a day at Bluff Springs Conservation Area (CA) near Stockton. This mostly wooded 415-acre area features one of the best sandstone savanna/open woodland restorations in southwest Missouri. The area also includes a large, natural sandstone glade, and both savanna and glade are maintained through periodic prescribed burning. This treatment suppresses invasive plants and favors the native wildflowers, grasses, shrubs and trees.

Bluff Springs CA is home to a multitude of wildlife species, including deer, turkey and squirrel. In particular, the native grasses that grow in the savanna's understory provide important habitat for ground-nesting birds, such as quail and turkey. More than 15 species of native legumes (plants, such as partridge pea, that are in the bean family) growing in the understory provide important protein-rich seeds for wildlife. Scattered post, black, blackjack and white oaks along with hickories grow over a lush, native-plant ground cover. Here and there are snags—standing dead trees—that appeal to cavity-nesting wildlife. These different habitat components attract redheaded woodpeckers, summer tanagers, indigo buntings and blue-winged warblers.

Wildflowers will be blooming during your May visit, and you can expect to see some woodland, prairie and glade favorites, including lead plant, prairie coreopsis, goat's rue, bird's-foot violet and Sampson's snakeroot.

While the area does have a couple of ponds, access is poor, and fishing is limited. But don't overlook the value of these ponds for wildlife photography. If you set up early in the morning or late in the afternoon, you may catch images of deer and other wildlife coming to drink during the day's "golden light" hours.

An overnight stay will give you an early start on morning birding and wildlife viewing. Primitive camping is available on the south edge of the property in a designated area located just north of the parking lot. The area has no privies or trash service, so plan to pack out all waste and trash.

If you enjoy squirrel hunting, mark your calendar to come back in September to take advantage of the area's good squirrel population. Begin your visit with a trip to the area's website (listed below) for the brochure, map and bird list.

—Bonnie Chasteen, photo by David Stonner

📷 25–70 mm lens • f/4.5 • 1/80 sec • ISO 400

**Recreation opportunities:** Bird watching, camping, hunting in season, nature study and photography

**Getting there:** From Stockton, travel six miles north on Route J, then west a half mile on County Road 752, then north a quarter mile on County Road 1701, and west a quarter mile on County Road 724.

### For More Information

Call 417-895-6880, or visit [mdc.mo.gov/a9101](http://mdc.mo.gov/a9101).





# Hunting and Fishing Calendar

## FISHING

	OPEN	CLOSE
Black Bass from Ozark streams	5/26/12	2/28/13
Bullfrogs and Green Frogs	Sunset	Midnight
	6/30/12	10/31/12
Paddlefish on the Mississippi River	3/15/12	5/15/12
Trout Parks	3/01/12	10/31/12

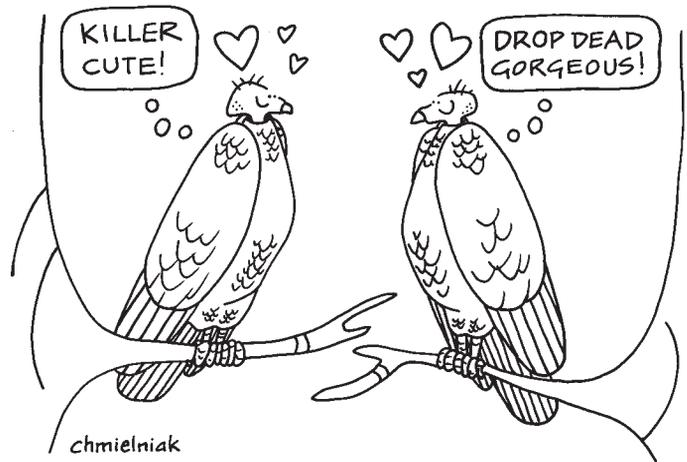
## HUNTING

	OPEN	CLOSE
Coyote	5/07/12	3/31/13
Deer		
Firearms		
November	11/10/12	TBA
Furbearers	11/15/12	1/31/13
Groundhog	5/09/12	12/15/12
Pheasant		
North Zone	11/01/12	1/15/13
Southeast Zone	12/01/12	12/12/12
Quail	11/01/12	1/15/13
Rabbit	10/01/12	2/15/13
Squirrel	5/26/12	2/15/13
Turkey		
Firearms		
Spring	4/16/12	5/6/12
Fall	10/1/12	10/31/12
Waterfowl	please see the <i>Waterfowl Hunting Digest</i> or see <a href="http://mdc.mo.gov/node/3830">mdc.mo.gov/node/3830</a>	

## TRAPPING

	OPEN	CLOSE
Beaver and Nutria	11/15/12	3/31/13
Furbearers	11/15/12	1/31/13
Otters and Muskrats	11/15/12	2/20/13

For complete information about seasons, limits, methods and restrictions, consult the *Wildlife Code* or the current summaries of *Missouri Hunting and Trapping Regulations* and *Missouri Fishing Regulations*, *The Spring Turkey Hunting Regulations and Information*, *the Fall Deer and Turkey Hunting Regulations and Information*, *the Waterfowl Hunting Digest* and *the Migratory Bird Hunting Digest*. For more information visit [mdc.mo.gov/node/130](http://mdc.mo.gov/node/130) or permit vendors.



Beauty is in the eye of the beholder.

## Contributors



BRETT DUFUR, an MDC editor, is writing a history of the Department for its 75th anniversary. He has authored numerous books on Missouri's outdoors including the Katy Trail, wine country and the Lewis and Clark Trail. He lives in Rocheport with his family and loves to paddle the Missouri River and explore wild places.

GLADYS J. RICHTER is an interpretive freelance writer who lives near Richland with her family. She enjoys a variety of outdoor activities, including fishing, hunting, hiking and gardening with native plants. Prior to becoming a freelance writer, she worked in the Department's Outreach & Education Division in Joplin.



NICK KUHN is the community forestry coordinator under the Forestry Division. He works with other foresters to incorporate federal and state objectives at regional and community levels. His goal is to create a comprehensive and cohesive community forestry program for all communities in Missouri.

## Operation Game Thief

Help put game thieves out of business. If you see a possible violation in progress, call your county conservation agent immediately or dial the toll-free number below:

**1-800-392-1111**

All information is kept in strict confidence. Desirable information includes names of violators, vehicle description and license number, as well as the violation location.

## Report Black Bear Sightings

Missourians care about conservation, so citizens will be glad to know they can help manage the Show-Me State's growing black-bear population with a phone call or a quick trip online. Citizen reports of bear sightings provide a cost-effective way of collecting data about bear distribution and abundance. To report a bear sighting, call 573-815-7900, or fill out the report form at [mdc.mo.gov/node/11348](http://mdc.mo.gov/node/11348).

# AGENT NOTES

## *Enforcement Aids Wildlife Restoration.*

IN 1823, MY ANCESTORS settled on the farm where I now reside in Callaway County. Deer at that time were documented as abundant. In the late 1800s and early 1900s, commercial harvest of deer nearly brought this population down to zero. As the Missouri Department of Conservation formed in 1937, wildlife restoration was a priority and the protection of wildlife, including deer, became the duty of the newly defined conservation agent.

In 1938, the first class of 35 conservation agents attended an intensive two-week training before being assigned to one of four districts throughout the state. The hunting of deer had been stopped in 1937 in order for restoration efforts to begin. Resource enforcement by these conservation agents was a must to help protect the small herd of 5,000 deer. By 1944, efforts were moving in a positive direction, and the population was estimated at 15,000 deer. That year a two-day buck-only hunt was established in 20 counties.

Resource enforcement by conservation agents is a basic tool for game management. Resource biologists need the protection of species as they start their restoration

efforts. It has been said that without resource enforcement there would be no resources, and without resources there would be no resource enforcement. Great success has occurred with a partnership between these two.

It is interesting to speak with my father who remembers the days of never seeing a deer on the family farm.

However, now it is common for my sons to see several deer daily. The protection and restoration efforts of the Missouri Department of Conservation and conservation agents are something we all can be proud of.

If you witness or suspect a wildlife violation, report it to your local conservation agent or call the Operation Game Thief hotline toll free 1-800-392-1111, which is manned 24 hours a day.



**Todd Houf is the conservation agent for Callaway County. If you would like to contact the agent for your county, phone your regional conservation office listed on Page 3.**



DAVID STONNER

Deer



Subscribe online • [mdc.mo.gov/node/9087](http://mdc.mo.gov/node/9087) • Free to Missouri households



## I Am Conservation

In September 2011, a dedication ceremony was held for a donation of nearly 1,000 acres in Clinton County. Thomas F. McGee Jr., deceased, donated the land to be preserved as a natural area and enjoyed by the public. A few of McGee's relatives who attended the dedication are pictured above: Thomas R. McGee, Lucy Cook, Molly McGee, Amy Shields and Sheila Lillis. "My brother Tommy always loved nature, so this land was a special place for him," says McGee's sister Molly. "He didn't want the land to be developed, but to be saved so that others could enjoy this area as he did. He was so impressed with the Missouri Department of Conservation that he entrusted them with this place that was so important to him. I am so proud to have my family's name on this property. I hope it is enjoyed by many people for years to come, as Tommy envisioned." —*Photo by David Stonner*